Product/Process Change Notice - PCN 23_0268 Rev. -

Analog Devices, Inc. One Analog Way, Wilmington, MA 01887, USA

This notice is to inform you of a change that will be made to certain ADI products (see Appendix A) that you may have purchased in the last 2 years. **Any inquiries or requests with this PCN (additional data or samples) must be sent to ADI within 30 days of publication date.** ADI contact information is listed below.

PCN Title:	Bond Wire Conversion and Mold Compound Change for ADSP-BF70x/BF70xW Processors in 184-Ball BGA Package
Publication Date:	23-Jan-2024
Effectivity Date:	26-Apr-2024 *(the earliest date that a customer could expect to receive changed material)*
Revision Description:	Initial Release.

Description Of Change:

Change of bond wire material from Gold (Au) to Copper (Cu) and change of molding compound from Sumitomo G770LC to Kyocera KE G1280TS.

Reason For Change:

Ensure continuity of supply in order to meet customer demand.

Impact of the change (positive or negative) on fit, form, function & reliability:

There is no change to form, fit, functionality or reliability.

Product Identification *(this section will describe how to identify the changed material)*

Change will be differentiated by date code.

Summary of Supporting Information:

Qualification has been performed per AEC-Q100, Stress Test Qualification for Integrated Circuits. See attached Qualification Results Summary.

Supporting Documents

Attachment 1: Type: Qualification Results Summary

ADI_PCN_23_0268_Rev_-_Qualification Report.pdf...

Attachment 2: Type: Delta Qualification Matrix

ADI_PCN_23_0268_Rev_-_Delta-Qualification-Matrix-ZVEI-5_0_16.xlsm...

Attachment 3: Type: Detailed Change Description

ADI_PCN_23_0268_Rev_-_184-ball BGA Material Changes.pdf...

Note: If applicable, the device material declaration will be updated due to material change.

ADI Contact Information:

For questions on this PCN, please send an email to the regional contacts below or contact your local ADI sales representatives.

Americas:	Europe:	Japan:	Rest of Asia:

PCN_Americas@analog.com	PCN_Europe@analog.com	PCN_Japan@analog.com	PCN_ROA@analog.com

Appendix A - Affected ADI Models:

Added Parts On This Revision - Product Family / Model Number (26)

ADSP-BF701 / ADSP-BF701BBCZ-2	ADSP-BF701 / ADSP-BF701KBCZ-1	ADSP-BF701 / ADSP-BF701KBCZ-2	ADSP-BF701W-11 / ADBF701WCBCZ211	ADSP-BF703 / ADSP-BF703BBCZ-3
ADSP-BF703 / ADSP-BF703BBCZ-4	ADSP-BF703 / ADSP-BF703KBCZ-3	ADSP-BF703 / ADSP-BF703KBCZ-4	ADSP-BF703W-11 / ADBF703WCBCZ311	ADSP-BF703W-11 / ADBF703WCBCZ411
ADSP-BF705 / ADSP-BF705BBCZ-3	ADSP-BF705 / ADSP-BF705BBCZ-4	ADSP-BF705 / ADSP-BF705KBCZ-3	ADSP-BF705 / ADSP-BF705KBCZ-4	ADSP-BF705W-11 / ADBF705WCBCZ311
ADSP-BF705W-11 / ADBF705WCBCZ411	ADSP-BF707 / ADSP-BF707BBCZ-3	ADSP-BF707 / ADSP-BF707BBCZ-4	ADSP-BF707 / ADSP-BF707BBCZ-4RL	ADSP-BF707 / ADSP-BF707KBCZ-3
ADSP-BF707 / ADSP-BF707KBCZ-4	ADSP-BF707 / ADSPBF707BBCZ4-EGE	ADSP-BF707W-11 / ADBF707WCBCZ311	ADSP-BF707W-11 / ADBF707WCBCZ411	ADSW4000 / ADSW4000-P
ADSW4000 / ADSW4000-Y				

Appendix B - Revision History:			
Rev	**Publish Date**	**Effectivity Date**	**Rev Description**
Rev. -	23-Jan-2024	26-Apr-2024	Initial Release.

ANALOG DEVICES

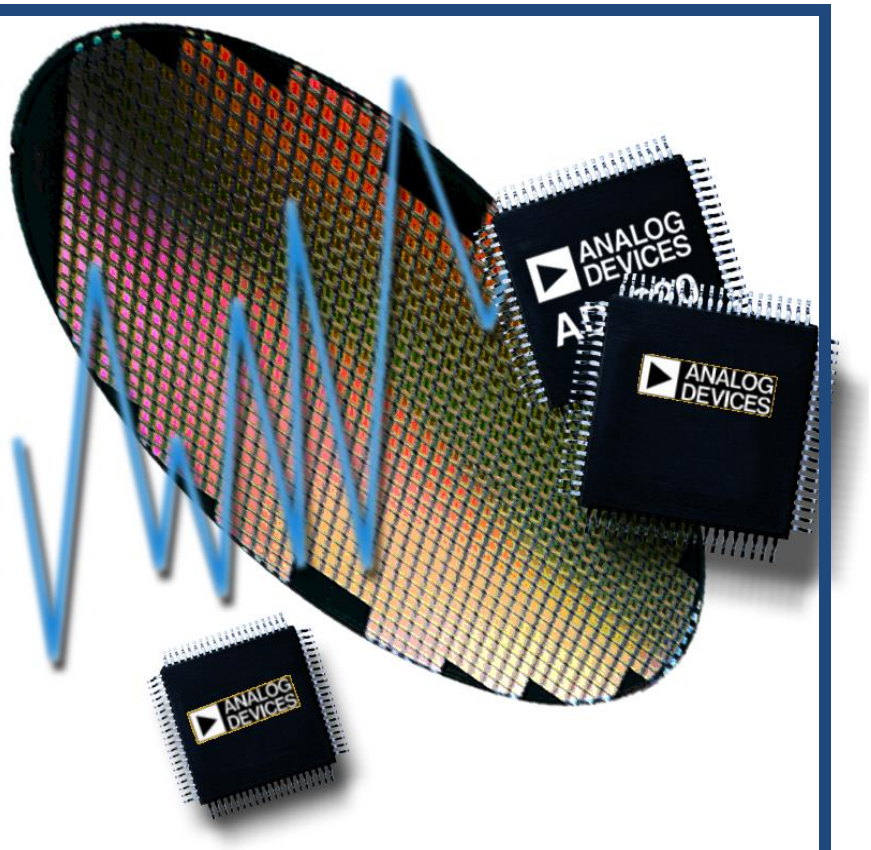
AHEAD OF WHAT'S POSSIBLE™

Bond Wire Conversion and Mold Compound Change for ADSP-BF70x/ BF70xW Processors in 184-ball BGA Package

Package Detailed Material Changes

184-ball BGA Material Changes

Change Item	From	To
Bond Wire Material	Au	CuPdAu
Molding Compound	Sumitomo G770LC	Kyocera KE G1280TS



Reliability Report

Report Title: ADSP-BF701/701W, ADSP-BF703/703W, ADSP-BF705/705W, ADSP-BF707/707W CSP_BGA with Cu Wire at SK3 Automotive Qualification

Report Number: 17054

Revision: B

Date: 26 October 2020

Summary

This report documents the successful completion of the reliability qualification requirements for the Automotive Grade 2 release of the ADSP-BF701, ADSP-BF703, ADSP-BF705, and ADSP-BF707, ADSP-BF701W-11, ADSP-BF703W-11, ADSP-BF705W-11, ADSP-BF707W-11 product in a 184-CSP_BGA package with Cu wire. The ADSP-BF70x is a Low Power 400MHz Blackfin+ Embedded Processor with 1MByte L2 SRAM.

Rev A of the report was issued when requirements for the consumer release were met. This is an updated final report with the AEC Q006 requirements documented.

Table 1: ADSP-BF70x Product Characteristics

Die/Fab

Die Id	TMGP72 B
Die Size (mm)	4.22 x 4.09
Wafer Fabrication Site	E_TSMC1412
Wafer Fabrication Process	40nm CMOS
Approximate Transistor Count	106,000,000
Passivation Layer	undoped-oxide/SiN
Bond Pad Metal Composition	AlCu
Polyimide	Yes

Package/Assembly

Package	184-CSP_BGA
Body Size (mm)	12.00 x 12.00
Solder Ball Diameter (mm)	0.45
Assembly Location	SK3
Molding Compound	Kyocera KE G1280TS
Die Attach	Ablestik 2025D
Wire Type	PdCuAu 4N
Wire Dimension (mil)	0.8
Moisture Sensitivity Level	3
Maximum Peak Reflow Temperature (°C)	260

Description / Results of Tests Performed

Table 2 provides a description of the qualification tests conducted and the associated test results for products manufactured on the same technologies as described in Table 1. All devices were electrically tested before and after each stress. Any device that did not meet all electrical data sheet limits following stressing would be considered a valid (stress-attributable) failure unless there was conclusive evidence to indicate otherwise.

Table 2: ADSP-BF70x Qualification Test Results

Test Name	Specification	Conditions	Device	Lot #	Sample Size	Qty. Failures
High Temperature Storage Life (HTSL) [1]	JESD22-A103	150°C, 1,000 Hours	ADSP-BF705W	Q17054.1.3	45	0
				Q17054.2.1	45	0
				Q17054.3.1	45	0
Temperature Cycling (TC) [1,3]	JESD22-A104	-55°C/+150°C, 2,000 Cycles	ADSP-BF705W	Q17054.1.6	69[4]	0
				Q17054.2.4	75	0
				Q17054.3.4	75	0
Temperature Humidity Bias (THB) [1,3]	JESD22-A101	85°C, 85%RH, Biased, 2,000 Hours	ADSP-BF705W	Q17054.1.4	75	0
				Q17054.2.2	75	0
				Q17054.3.2	75	0
Unbiased Highly Accelerate Stress Test (UHAST) [1,3]	JESD22-A118	130°C, 85%RH, 2atm Biased, 96 Hours	ADSP-BF705W	Q17054.1.5	77	0
				Q17054.2.3	77	0
				Q17054.3.3	77	0
Early Life Failure Rate (ELFR) [1]	AEC-Q100-008	Ta=125°C, 48 Hours	ADSP-BF707	QL11074ELF01	180	0
				QL11074ELF02	180	0
				QL11074ELF03	180	0
				QL11074ELF04	180	0
				QL11074ELF05	90	0
				QL11074ELF06	180	0
				QL11074ELF07	89	0
				QL11074ELF08	180	0
				QL11074ELF09	89	0
				QL11074ELF10	180	0
				QL11074ELF11	89	0
				QL11074ELF12	180	0
				QL11074ELF13	89	0
				QL11074ELF14	180	0
				QL11074ELF15	89	0
				QL11074ELF16	180	0
				QL11074ELF17	89	0
High Temperature Operating Life (HTOL) [2,3]	JESD22-A108	125°C<Tj<135 °C, Biased, P1000	ADSP-BF707	QL11074HTL03	77	0
				QL11074HTL01	77	0
				QL11074HTL02	77	0

[1] Pre- and post-stress electrical test was performed at room and hot temperatures.

[2] Pre- and post-stress electrical test was performed at hot, room and cold temperatures.

[3] These samples were subjected to preconditioning (per J-STD-020 Level 3) prior to the start of the stress test. Level 3 preconditioning consists of the following: Bake: 24 hrs @ 125°C, Unbiased Soak: 192 hrs @ 30°C, 60%RH, Reflow: 3 passes through an oven with a peak temperature of 260°C.

[4] Per AEC Q006, 77 units completed 1000 cycles with no rejects. 75 units from each lot then continued through 2000 cycles TCT. At the 2000 cycle readpoint, 6 units from the lot were damaged in the handler at electrical test caused by a misalignment in the device carrier. See FA218035/8d20208015 for details.

ESD Test Results

The results of Human Body Model (HBM) and Field-Induced Charged Device Model (FICDM) ESD testing are summarized in Table 3. ADI measures ESD results using stringent test procedures based on the specifications listed. Any comparison with another supplier's results should ensure that the same ESD test procedures have been used. For further details, please see the EOS/ESD chapter of the ADI Reliability Handbook (available via the 'Quality and Reliability' link on Analog Devices' web site).

Table 3: ADSP-BF70x ESD Test Results

ESD Model	Package	ESD Test Spec	RC Network	Highest Pass Level	First Fail Level	Class
FICDM	184-CSP_BGA All Pins	JS-002	1Ω, Cpkg	±500V	±750V	NA
	184-CSP_BGA Corner Pins Only			±750V	NA	NA
HBM	184-CSP_BGA	ESDA/JEDEC JS-001-2011	1.5kΩ, 100pF	±2000V	±2500V	2

Latch-Up Test Results

Three samples of the ADSP-BF70x were latch-up tested at TA=125°C per JEDEC Standard JESD78, Class II. Pre- and post-stress electrical test was performed at room and hot temperatures. All pins passed.

Passing Positive Current	Passing Negative Current	Passing Over-Voltage
+200mA	-200mA	+1.8V/+2.85V/+5.205V

Approvals

Reliability Engineer: Carolyn Pipitone

Additional Information

Data sheets and other additional information are available on Analog Devices' web site